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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/462,796	01/13/2000	TAKAYOSHI WATANABE	500.38090X00	5528

7590

04/16/2004

ANTONELLI TERRY STOUT & KRAUS
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209

EXAMINER

NGUYEN, THANH T

ART UNIT PAPER NUMBER

2813

DATE MAILED: 04/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/462,796

Applicant(s)

WATANABE ET AL.

Examiner

Thanh T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/6/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 34-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 53 is/are allowed.
- 6) ☒ Claim(s) 34-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed on 1/6/04 have been fully considered but they are not persuasive.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 34-52 are stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (U.S. Patent No. 6,271,110) or Akram et al. (U.S. Patent No. 5,592,736) or Takahiro et al. (JP patent No. 08191072) in view of Akira (JP Patent No. 05-121409), Ochiai et al. (U.S. Patent No. 5,643,831) and Michihiko et al. (JP Patent No. 05206221) as previously applied.

Referring to figures 4-12e, teaches a method of producing a semiconductor device comprising the steps of:

Forming a plurality of pyramidal bump electrodes (16/34) on the semiconductor device,
and

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Connecting the pyramidal bump electrodes to pad electrodes (32) of the semiconductor device,

The step of forming the plurality of pyramidal bump electrodes including: a step of forming etched holes (see col. 5, lines 60-64) by anisotropically etching base material having a crystal orientation (see col. 8, lines 37-42), and

A step of filling up the etched holes by plating a metal (see col. 9, lines 17-20).

However, the reference does not teach etching a first oxidized film on the base material, removing the first oxidized film and forming a second oxidized film on the etched holes, forming a primary film of the same material as the metal for plating of the metal on the base material, and filling the metal such as gold/nickel, copper.

Akira teaches filling the opening with a copper or gold (20/26, see paragraph 21) by electroless plating.

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would fill the opening with a copper or gold by electroless plating in process of Yamaguchi et al. as taught by Akira because the process would provide excellent selectivity and adhesive strength on the film.

Ochiai et al. teaches a method of etching a first oxidized film on the base material, removing the first oxidized film and forming a second oxidized film on the etched holes (see figures 8A-8H and related text).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would etch a first oxidized film on the base material, removing the first oxidized film and forming a second oxidized film on the etched holes in

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process of Yamaguchi et al. or Akram et al. as taught by Ochiai et al. because the process would bring the plate into a chemically stable condition and provides a low wetability to the plate, so a durability of the plate is improve and formed solder balls can be easily transferred.

Michihiko teaches forming a primary film of the same material as the metal for plating of the metal on the base material (see page 3, paragraph#7, meeting claim 35).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form a primary film of the same material as the metal for plating of the metal on the base material in process or Yamaguchi et al. or Akram et al. or Takahiro et al. as taught by Michihiko because the process would prevent generation of short-circuit.

It is known in the art to form the filling metal such as gold/nickel, copper.

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form the filling metal such as gold/nickel, copper in process of Yamaguchi et al. or Akram et al. because process in known in the art since determining the optimum material for the layer only involved routine skill in the art.

Allowable Subject Matter

Claim 53 is allowable over the prior art.

Response to Arguments

Applicant's arguments filed on 1/6/04 have been fully considered but they are not persuasive.

Applicant contends none of the prior art taught or suggested the method of plating gold on the metal filled by plating or the surface of a protruded electrode being plated with gold after the transfer. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., plating gold on the metal filled by plating or the surface of a protruded electrode being plated with gold after the transfer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (571) 272-1695, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on (571) 272-1702. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (**See MPEP 203.08**).



Thanh Nguyen
Patent Examiner
Patent Examining Group 2800